



(19) **Europäisches Patentamt**
European Patent Office
Office européen des brevets



(11) **EP 0 889 471 B1**

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

06.05.2004 Bulletin 2004/19

(51) Int. Cl.7: **G11B 20/00**

(21) Application number: **98111444.0**

(22) Date of filing: **22.06.1998**

(54) Custom character-coding compression for encoding and watermarking media content

Angepasste zeichenkodierte Kompression zur Kodierung und Erzeugung von Wasserzeichen auf
einem Medieninhalt

Compression de codage à caractères apte à épouser le codage et formation de filigranes d'un contenu
au milieu

(84) Designated Contracting States:
DE ES FR GB IT

(30) Priority: **03.07.1997 US 888014**

(43) Date of publication of application:
07.01.1999 Bulletin 1999/01

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Description**BACKGROUND OF THE INVENTION****1. Field of the Invention**

[0001] The present invention relates to the field of computing. More particularly, the present invention relates to a method for protecting encoded media content for network distribution.

2. Description of the Related Art

[0002] Recent technological advances involving digital data compression, network bandwidth improvement and mass storage have made networked distribution of media content more feasible. That is, media content, such as digitized music, can be conveniently distributed over the Internet. To protect the intellectual property rights associated with a particular piece of media content, it is desirable to obscure the media content to prevent pirating of the content.

[0003] Consequently, what is needed is a way for compressing media content for convenient network distribution, while also securing the compressed media content against unauthorized use.

[0004] Document JP 06 302103 A by Sanyo Electric Co Ltd discloses a digital information recording/reproducing device comprising a first data compression encoding circuit for compressing right channel data and a second data compression encoding circuit for compressing left channel data.

SUMMARY OF THE INVENTION

[0005] The present invention provides a method for compressing media content for convenient public distribution, such as over a computer network, while also securing the media content for controlling distribution of the media content and for preventing unauthorized use of the media content. The advantages of the present invention are provided by a method of compressing media content according to the appended claims. In a method of compressing media content according to an embodiment of the invention

a first predetermined portion of a media content is compressed using a first data-based compression algorithm and inserted into a first portion of a data frame. A second predetermined portion of the media content is compressed using a second data-based compression algorithm and is inserted into a second portion of the data frame. The second predetermined portion of the media content is different from the first predetermined portion of the media content, and the second data-based compression algorithm is different from the first data-based compression algorithm. At least one of the first and second data-based compression algorithms is a private data-based compression algorithm, i.e. a data-

based compression algorithm based on data which is not publicly available. The first and second portions of the data frame are separated by a predetermined header code, or can be separated by relative positions of the first and second predetermined portions of compressed media content within the data frame.

[0006] The present invention also provides a method for inserting a data stream not associated with the media content into a compressed media content bit stream.

10 [0007] The inserted data stream is carried by at least one symbol in at least one initial data set associated with the DBCA. A preferential implementation uses designated symbols in one or more Huffman codebooks for embedding a watermark in the compressed bit stream. The value of the watermark bits recovered from the bit stream depend upon either the values associated with the symbols or alternatively the position of the symbol in the compressed bit stream.

[0008] According to the invention, a plurality of data frames are generated and are made available for distribution, for example, by transmission over a computer network, such as the Internet. Alternatively, the data frames can be made publicly available for storage in a memory device, such as a CD ROM.

[0009] A plurality of predetermined portions of the media content can be compressed using data-based compression algorithms and grouped into a respectively different portion of the data frame. Each respective predetermined portion of the media content is different from the first and the second predetermined portions of the media content. Similarly, the data-based compression algorithm used to compress a respective portion of the media content is different from the first and the second data-based compression algorithms. At least one of the data-based compression algorithms is a private data-based compression algorithm.

[0010] Initial data associated with each private data-based compression algorithm is encrypted and made publicly available when the data frames are made available. The encrypted initial data is grouped into a data envelope within a data frame that is preferably available no later than a first data frame containing media content compressed using the private data-based compression algorithm with which the encrypted initial data is associated, but can be made available during a later data frame. Examples of initial data associated with at least one private data-based compression algorithm include a Huffman code-book and/or a vector quantization code-book.

[0011] According to the invention, the media content can include audio content, such as music and/or speech, images, video content, graphics and/or textual content.

BRIEF DESCRIPTION OF THE DRAWING

[0012] The present invention is illustrated by way of example and not limitation in the accompanying figures

in which like reference numerals indicate similar elements and in which:

Figure 1 shows a flow diagram for a media content compression process according to the present invention;

Figure 2 shows an arrangement of data in a data frame according to the present invention; and Figure 3 shows a flow diagram for inserting a data stream not associated with the media content into a compressed media content bit stream according to the present invention.

DETAILED DESCRIPTION

[0012] The present invention provides a method for compressing media content for convenient distribution, such as over a computer network, while also securing the media content for controlling distribution of the media content and for preventing pirating of the media content. Compression algorithm, as used herein, is an algorithm that accepts an input data stream and produces a corresponding output data stream having substantially fewer bits. A data-based compression algorithm (DBCA) is an algorithm that is a subset of compression algorithms in general. The action of a DBCA, together with associated data, depends on a number of initial data values that have been determined before the compression operation begins (that is, without any knowledge of the particular input data sequence to be compressed). The initial data values may represent parametric values or may be used as lookup tables (i.e., as code-books) by the algorithm. Typical DBCAs are noiseless compression (e.g., Huffman) algorithms and vector quantization (VQ) algorithms. The initial data values may be static, i.e., the initial data values do not change, or dynamic, i.e., the initial data values adapt to the input data stream during the course of compression. Two DBCAs are different if the initial data values are different, whether the algorithms are different.

[0013] Figure 1 shows a flow diagram of a media content compression-decompression process 10 according to the present invention. At step 11, a media content, such as audio signals, are sampled using well-known analog-to-digital techniques, or the input may be a digital representation of an analog signal. At step 12, the time-domain samples obtained in step 11 are converted to frequency-domain samples using well-known Fourier transform techniques.

[0014] At step 13, a selected portion of the frequency-domain samples of the media content are compressed in a well-known manner using a publicly available DBCA, such as a DBCA having a public Huffman code-book as initial data. Each binary character code or token of the public DBCA represents at least one different quantized representation of the frequency-domain samples. When the media content is music, the selected portion of the frequency-domain samples that are com-

pressed using the public DBCA corresponds to a selected frequency band of the audio content frequency spectrum, for example, 300 Hz to 3 kHz. In video transform coding, DC coefficients would be encoded with the standard table, while the AC coefficients would be encoded with the custom (private) table.

[0015] At step 14, the remaining frequency-domain samples corresponding to the remainder of the audio content frequency spectrum are similarly compressed in a well-known manner using a private DBCA, that is, a DBCA in which the initial data is not publicly available. Examples of initial data for private DBCA include private Huffman code-books and private VQ code-books. Alternatively, the compression performed in steps 13 and 14 can be done by any well-known greedy-type algorithm that converts data into tokens or character codes, such as a VQ algorithm, as long as at least one of the two compression steps is performed by a private greedy-type algorithm. Of course, the present invention provides that the data compression of each step 13 and 14 can be performed by a private DBCA.

[0016] At step 15, the tokens for the frequency-domain samples that were compressed using the public DBCA are inserted into a first predetermined portion 31 of a data frame 30, shown in Figure 2. A data frame, as used herein, is an encapsulation of related data, for example, data associated with a given time period, frequency bandwidth, spatial domain or cepstral domain. A data envelope, as used herein, is an encapsulation of a subset of the data within a given data frame. For example, a data frame in a perceptual audio coder might contain a compressed representation of 1024 consecutive samples of audio data. A data envelope within that particular data frame might contain a representation of the frequency interval DC to 300 Hz. Encapsulation, as used here, may be explicit or implicit. An example of an explicit encapsulation is use of a predetermined character code or a header. An implicit encapsulation, that is, an encapsulation without a header, can be defined by relative positions of the encapsulated data within the data frame.

[0017] At step 16, the tokens for the frequency-domain samples that were compressed using the private DBCA are inserted into a second portion 32 of data frame 30. According to the invention, second portion 32 can be explicitly or implicitly encapsulated within data frame 30. When second portion 32 is explicitly encapsulated within data frame, a header 33 formed by a predetermined character code or predetermined sequence

of character codes containing information relating to the private DBCA, such as escape characters and/or the number of characters contained in second portion 32.

[0018] At step 17, the data frames are made publicly available, such as available for distribution by transmission in a well-known manner over a computer network, such as the Internet, or by storage in a user-owned storage device, such as a CD-ROM, at a point-of-sale device. In one embodiment of the present invention, the

initial information associated with each private DBCA that is used is encrypted in a well-known manner using a secure encryption algorithm and is encapsulated in the data frames preferably no later than the first data frame containing media content compressed using the private DBCA with which the encrypted initial data is associated, but can be encapsulated during a later data frame. In another embodiment, the initial data for the public DBCA is made available with the encrypted initial data of the private DBCA. In yet another alternative embodiment, both the initial data for the public and the private DBCAs are available at the recipient of publicly available data frames 30 and are not distributed when the data frames 30 are distributed. Of course, for this embodiment, the encrypted initial data of the private DBCA is secure and is not accessible to unauthorized individuals. At step 18, the data frames and any initial data are received by the intended recipient.

[0019] At step 19, the tokens corresponding to the public DBCA in the first portion 31 of each data frame are decompressed using the public DBCA. At step 20, the character codes corresponding to the private DBCA in the second portion 32 of each data frame are decompressed using the private DBCA. When the first portion 31 of each data frame has been compressed by a private DBCA, portion 31 of each data frame is decompressed accordingly. When encrypted initial information is encapsulated in the data frames, the initial information is decrypted prior to decompression using the private DBCA. At step 21, the frequency-domain samples resulting from the decompression steps 19 and 20 are reassembled to form frequency-domain samples of the frequency spectrum of the media signal represented by each data frame. At step 22, the frequency-domain samples are transformed to time-domain samples using well-known inverse Fourier transform techniques. At step 23, the time-domain samples are converted to the media content using well-known digital-to-analog techniques.

[0020] When the initial data for the private DBCA is not known at step 20, steps 21-23 operate on only the portion of the media content that was contained in the first portion 31 of the data frames. In this way, a limited version of the media content is generated that may entice the recipient to purchase the entire media content because the fidelity of the media content is not satisfying.

[0021] Figure 3 shows a functional block diagram 40 of a system for inserting a data stream not associated with the media content into a compressed media content bit stream. In block 41, analog media content is quantized using well-known digital-to-analog quantizing techniques for digitized media content. Alternatively, the input may already be a digital representation of an analog signal. In block 42, the digitized media content is transformed from time-domain samples to frequency-domain samples using well-known Fourier transform and windowing techniques. In block 43, the floating point

frequency-domain samples are converted into integer values in a well-known manner. The quantizer output is applied to a custom, or private, DBCA at block 44. A plurality of symbols are output to a bit stream formatter 5 at block 45 which outputs a bitstream of compressed media content. Functional blocks 41-45 correspond to steps of 11-16 of method 10 shown in Figure 1.

[0022] Block 47 contains a data sequence as a string of bits that preferably represents watermark data, but can represent any information that is not associated with the media content. Block 48 contains control logic for selecting a watermark data site and sequencing watermark data bits into custom DBCA 44, which emits symbols to the bitstream formatter 45. According to the invention, private DBCA 44 can contain either a single data set (e.g., a single Huffman or VQ codebook) or a plurality of data sets (e.g., multiple Huffman or VQ codebooks).

[0023] Control and timing 48 can be implemented in many ways. For example, if the bit rate coming out of bit stream formatter 45 is N bits/sec, and M watermark bits per second are desired to be inserted, and 1 bit per watermark site is inserted (without loss of generality), then, timing and control 48 must insert a watermark bit on average every N/M bits coming out of bit stream formatter 45. (Hence, the path connecting the output of bitstream formatter 45 to control and timing 48.) In this case, timing and control 48 can be implemented as a reloadable : downcounter that indicates an insertion when the downcounter reloads. In a more secure implementation, randomness can be incorporated into control and timing 48 using a pseudo-random number generator that causes an insertion on average every N/M bits.

[0024] More generally, private DBCA 44 may have a plurality of distinct Huffman codes devoted to watermarking, for example, k is equal to 2^K characters. Then, up to K watermark bits can be inserted per special Huffman symbol. For purposes of security, more than one Huffman symbol devoted to the same bit sequence 40 might be chosen. In the case of K watermark bits per insertion, control and timing 48 causes an insertion on average every $(N/M)^K$ bits. Alternatively, custom DBCA 44 may use one or more otherwise unused codebook indices for watermark insertion. For example, when control and timing 48 indicates an insertion, bitstream formatter 45 may put a watermark index and some predetermined number of bits into the bitstream. In this case, the watermark index appears to indicate an unused codebook. Similarly, the position of the watermark index

50 may be used to indicate the value of the watermark data, for example, if the index occurs in an odd-numbered section in the bitstream, a "1" bit would be indicated, whereas appearance of the index in an even-numbered section indicates a "0" bit.

[0025] While the present invention has been described in connection with media having an audio content, such as music and/or speech, it will be appreciated and understood that the present invention is applicable

to media having audio and/or image and/or video and/or graph and/or textual content.

Claims

1. A method of compressing media content, the method comprising the steps of:

compressing (13) a first predetermined portion of a media content using a first data-based compression algorithm;

compressing (14) a second predetermined portion of the media content using a second data-based compression algorithm, the second predetermined portion of the media content being different from the first predetermined portion of the media content, and the second data-based compression algorithm being different from the first data-based compression algorithm,

characterized in that at least one of the first and second data-based compression algorithms is a private data-based compression algorithm.

2. The method according to claims 1 or 8, wherein one of the first and second data-based compression algorithms is a public data-based compression algorithm.
3. The method according to claim 1, further comprising the steps of:

grouping (15) the compressed first predetermined portion of the media content into a first portion (31) of a data frame (30); and grouping (16) the compressed second predetermined portion of the media content into a second portion (32) of the data frame (30).

4. The method according to claims 1 or 3, wherein the first (31) and second (32) portions of the data frame (30) are separated by a predetermined header code (33); or
wherein the first (31) and second (32) portions of the data frame (30) are separated by relative positions of the first and second predetermined portions of compressed media content within the data frame (30).
5. The method according to claim 3, further comprising the step (17) of making the data frame publicly available.
6. The method according to one or more of claims 1-5, wherein the media content includes audio content; or
wherein the media content includes images;

- or
 - wherein the media content includes video content; or
 - wherein the media content includes graphics;
 - or
 - wherein the media content includes textual content.

7. The method according to claim 6, wherein the audio content includes music; or
wherein the audio content includes speech.

8. A method of receiving data, the method comprising the steps of:

receiving (18) a publicly available data frame (30); decompressing a first predetermined portion (31) of the data frame (30) using a first data-based compression algorithm, the first predetermined portion (31) of the data frame (30) representing a first predetermined portion of a media content; and decompressing a second predetermined portion (32) of the data frame (30) using a second data-based compression algorithm, the second predetermined portion (32) of the data frame (30) being different from the first predetermined portion (31) of the data frame (30), the second predetermined portion (32) of the data frame (30) representing a second predetermined portion of the media content, and the second data-based compression algorithm being different from the first data-based compression algorithm.

characterized in that at least one of the first and second data-based compression algorithms is a private data-based compression algorithm.

9. The method according to claim 8, wherein the data frame is received from a computer network.

10. The method according to claim 8, wherein the step (18) of receiving the data frame includes the step of receiving the data frame by a memory device; and/or or wherein the steps of the method are per-

11. The method according to claim 10, wherein the

mined portion of the data frame representing a third predetermined portion of the media content, the method further comprising the step of decompressing a third predetermined portion of the data frame using a third data-based compression algorithm, and the third data-based compression algorithm being different from the first and the second data-based compression algorithms.

13. The method according to claim 12, wherein at least one of the first, second and third data-based compression algorithms is a private data-based compression algorithm.

14. The method according to claim 8, wherein each private data-based compression algorithm includes encrypted initial data that is associated with the private data-based compression algorithm, the method further comprising the step of:

decrypting each encrypted associated initial data of at least one private data-based compression algorithm.

15. The method according to claim 14, wherein the encrypted initial data is contained in the data frame; or wherein the initial data associated with at least one private data-based compression algorithm includes at least one Huffman code-book; or wherein the initial data associated with at least one private data-based compression algorithm includes at least one vector quantization code-book.

Patentansprüche

1. Ein Verfahren zum Komprimieren eines Medieninhalts, wobei das Verfahren die folgenden Schritte umfasst:

Komprimieren (13) eines ersten vorbestimmten Abschnitts eines Medieninhalts unter Verwendung eines ersten Daten-basierten Kompressionsalgorithmus;

Komprimieren (14) eines zweiten vorbestimmten Abschnitts des Medieninhalts unter Verwendung eines zweiten Daten-basierten Kompressionsalgorithmus, wobei der zweite vorbestimmte Abschnitt des Medieninhalts anders ist als der erste vorbestimmte Abschnitt des Medieninhalts und wobei der zweite Daten-basierte Kompressionsalgorithmus anders ist als der erste Daten-basierte Kompressionsalgorithmus,

dadurch gekennzeichnet, dass mindestens einer von dem ersten und dem zweiten Daten-basierten Kompressionsalgorithmus ein privater Daten-basiert Kompressionsalgorithmus ist.

5 2. Das Verfahren nach Anspruch 1 oder 8, bei dem einer von dem ersten und dem zweiten Daten-basierten Kompressionsalgorithmus ein öffentlicher Daten-basiert Kompressionsalgorithmus ist.

10 3. Das Verfahren nach Anspruch 1, das ferner folgende Schritte umfasst:

Gruppieren (15) des komprimierten ersten vorbestimmten Abschnitts des Medieninhalts in einem ersten Abschnitt (31) eines Daten-Rahmens (30); und

Gruppieren (16) des komprimierten zweiten vorbestimmten Abschnitts des Medieninhalts in einem zweiten Abschnitt (32) des Daten-Rahmens (30).

4. Das Verfahren nach Anspruch 1 oder 3, bei dem der erste (31) und der zweite (32) Abschnitt des Daten-Rahmens (30) durch einen vorbestimmten Anfangscode (33) getrennt sind; oder

bei dem der erste (31) und der zweite (32) Abschnitt des Daten-Rahmens (30) durch relative Positionen des ersten und des zweiten vorbestimmten Abschnitts des komprimierten Medieninhalts im Daten-Rahmen (30) getrennt sind.

5. Das Verfahren nach Anspruch 3, das ferner den Schritt (17) umfasst, den Daten-Rahmen öffentlich verfügbar zu machen.

35 6. Das Verfahren nach einem oder mehreren der Ansprüche 1 - 5, bei dem der Medieninhalt einen Audiodinhalt einschließt; oder

bei dem der Medieninhalt Bilder einschließt;

oder

bei dem der Medieninhalt einen Videoinhalt einschließt; oder

bei dem der Medieninhalt Graphiken einschließt; oder

bei dem der Medieninhalt einen Textinhalt einschließt.

7. Das Verfahren nach Anspruch 6, bei dem der Audiodinhalt Musik einschließt; oder

bei dem der Audiodinhalt Sprache einschließt.

50 8. Ein Verfahren zum Empfangen von Daten, wobei das Verfahren die folgende Schritte umfasst:

Empfangen (18) eines öffentlich verfügbaren Daten-Rahmens (30);

Dekomprimieren eines ersten vorbestimmten Abschnitts (31) des Daten-Rahmens (30) unter

Verwendung eines ersten Daten-basierten Kompressionsalgorithmus, wobei der erste vorbestimmte Abschnitt (31) des Daten-Rahmens (30) einen ersten vorbestimmten Abschnitt eines Medieninhalts darstellt; und Dekomprimieren eines zweiten vorbestimmten Abschnitts (32) des Daten-Rahmens (30) unter Verwendung eines zweiten Daten-basierten Kompressionsalgorithmus, wobei der zweite vorbestimmte Abschnitt (32) des Daten-Rahmens (30) anders ist als der erste vorbestimmte Abschnitt (31) des Daten-Rahmens (30), wobei der zweite vorbestimmte Abschnitt (32) des Daten-Rahmens (30) einen zweiten vorbestimmten Abschnitt des Medieninhalts darstellt, und wobei der zweite Daten-basierte Kompressionsalgorimus anders ist als der erste Daten-basierte Kompressionsalgorimus,

dadurch gekennzeichnet, dass mindestens einer von dem ersten und dem zweiten Daten-basierten Kompressionsalgorimus ein privater Daten-basierte Kompressionsalgorimus ist.

9. Das Verfahren nach Anspruch 8, bei dem der Daten-Rahmen von einem Computer-Netzwerk empfangen wird.

10. Das Verfahren nach Anspruch 8, bei dem der Schritt (18) des Empfangens des Daten-Rahmens den Schritt des Empfangens des Daten-Rahmens durch ein Speichergerät einschließt; und/oder
 bei dem die Schritte des Verfahrens für eine Mehrzahl von Daten-Rahmen durchgeführt werden.

11. Das Verfahren nach Anspruch 10, bei dem das Speichergerät eine CD-ROM ist.

12. Das Verfahren nach Anspruch 8, bei dem der Daten-Rahmen einen dritten vorbestimmten Abschnitt einschließt, wobei der dritte vorbestimmte Abschnitt anders ist als der erste und der zweite vorbestimmte Abschnitt des Daten-Rahmens, und wobei der dritte vorbestimmte Abschnitt des Daten-Rahmens einen dritten vorbestimmten Abschnitt des Medieninhalts darstellt,
 wobei das Verfahren ferner den Schritt des Dekomprimierens eines dritten vorbestimmten Abschnitts des Daten-Rahmens unter Verwendung eines dritten Daten-basierten Kompressionsalgoritmus umfasst, und wobei der dritte Daten-basierte Kompressionsalgorimus anders ist als der erste und der zweite Daten-basierte Kompressionsalgorimus.

13. Das Verfahren nach Anspruch 12, bei dem mindestens einer von dem ersten, dem zweiten und dem dritten Daten-basierten Kompressionsalgorithmus ein privater Daten-basierte Kompressionsalgorimus ist.

14. Das Verfahren nach Anspruch 8, bei dem jeder private Daten-basierte Kompressionsalgorimus verschlüsselte Anfangsdaten einschließt, die mit dem privaten Daten-basierten Kompressionsalgorimus assoziiert sind,
 wobei das Verfahren ferner den folgenden Schritt umfasst:
 Entschlüsseln aller verschlüsselten assoziierten Anfangsdaten vom mindestens einem privaten Daten-basierten Kompressionsalgorimus.

15. Das Verfahren nach Anspruch 14, bei dem die verschlüsselten Anfangsdaten im Daten-Rahmen enthalten sind; oder
 bei dem die mit mindestens einem privaten Daten-basierten Kompressionsalgorimus assoziierten Anfangsdaten mindestens eine Huffman-Codetabelle einschließen; oder
 bei dem die mit mindestens einem privaten Daten-basierten Kompressionsalgorimus assoziierten Anfangsdaten mindestens eine Vektorquantisierungs-Codetabelle einschließen.

Revendications

- Procédé pour compresser un contenu multimédia, le procédé comportant les étapes consistant à :
 - compresser (13) une première partie prédéterminée d'un contenu multimédia en utilisant un premier algorithme de compression à base de données,
 - compresser (14) une deuxième partie prédéterminée du contenu multimédia en utilisant un deuxième algorithme de compression à base de données, la deuxième partie prédéterminée du contenu multimédia étant différente de la première partie prédéterminée du contenu multimédia, et le deuxième algorithme de compression à base de données étant différent du premier algorithme de compression à base de données,
 caractérisé en ce qu'au moins l'un desdits premier et deuxième algorithmes de compression à base de données est un algorithme de compression à base de données privé.
- Procédé selon la revendication 1 ou 8, dans lequel l'un desdits premier et deuxième algorithmes de compression à base de données est un algorithme

de compression à base de données public.

3. Procédé selon la revendication 1, comportant en outre les étapes consistant à :

grouper (15) la première partie prédéterminée compressée du contenu multimédia dans une première partie (31) d'une trame de données (30), et
grouper (16) la deuxième partie prédéterminée compressée du contenu multimédia dans une deuxième partie (32) de la trame de données (30).

4. Procédé selon la revendication 1 ou 3, dans lequel les première (31) et deuxième (32) parties de la trame de données (30) sont séparées par un code d'en-tête prédéterminé (33), ou

dans lequel les première (31) et deuxième (32) parties de la trame de données (30) sont séparées par des positions relatives des première et deuxième parties prédéterminées du contenu multimédia compressé dans la trame de données (30).

5. Procédé selon la revendication 3, comportant en outre l'étape (17) consistant à rendre la trame de données publiquement disponible.

6. Procédé selon l'une quelconque des revendications 1 à 5, dans lequel le contenu multimédia inclut un contenu audio, ou

dans lequel le contenu multimédia inclut des images, ou
dans lequel le contenu multimédia inclut un contenu vidéo, ou
dans lequel le contenu multimédia inclut des graphiques, ou
dans lequel le contenu multimédia inclut un contenu textuel.

7. Procédé selon la revendication 6, dans lequel le contenu audio inclut de la musique, ou
dans lequel le contenu audio inclut des paroles.

8. Procédé pour recevoir des données, le procédé comportant les étapes consistant à :

recevoir (18) une trame de données publiquement disponible (30),
décompresser une première partie prédéterminée (31) de la trame de données (30) en utilisant un premier algorithme de compression à base de données, la première partie prédéterminée (31) de la trame de données (30) représentant une première partie prédéterminée d'un contenu multimédia, et
décompresser une deuxième partie prédétermi-

née (32) de la trame de données (30) en utilisant un deuxième algorithme de compression à base de données, la deuxième partie prédéterminée (32) de la trame de données (30) étant différente de la première partie prédéterminée (31) de la trame de données (30), la deuxième partie prédéterminée (32) de la trame de données (30) représentant une deuxième partie prédéterminée du contenu multimédia, et le deuxième algorithme de compression à base de données étant différent du premier algorithme de compression à base de données,

caractérisé en ce qu'au moins l'un desdits premier et deuxième algorithmes de compression à base de données est un algorithme de compression à base de données privé.

9. Procédé selon la revendication 8, dans lequel la trame de données est reçue à partir d'un réseau informatique.

10. Procédé selon la revendication 8, dans lequel l'étape (18) consistant à recevoir la trame de données inclut l'étape consistant à recevoir la trame de données par un dispositif mémoire, et/ou
dans lequel les étapes du procédé sont effectuées pour une pluralité de trames de données.

11. Procédé selon la revendication 10, dans lequel le dispositif mémoire est un CD-ROM.

12. Procédé selon la revendication 8, dans lequel la trame de données inclut une troisième partie prédéterminée, la troisième partie prédéterminée de la trame de données étant différente des première et deuxième parties prédéterminées de la trame de données, et la troisième partie prédéterminée de la trame de données représentant une troisième partie prédéterminée du contenu multimédia,

le procédé comportant en outre l'étape consistant à décompresser une troisième partie prédéterminée de la trame de données en utilisant un troisième algorithme de compression à base de données, et le troisième algorithme de compression à base de données étant différent des premier et deuxième algorithmes de compression à base de données.

13. Procédé selon la revendication 12, dans lequel au moins l'un desdits premier, deuxième et troisième algorithmes de compression à base de données est un algorithme de compression à base de données privée.

14. Procédé selon la revendication 8, dans lequel chaque algorithme de compression à base de données privé inclut des données initiales cryptées qui sont

associées à l'algorithme de compression à base de données privé,
le procédé comportant en outre l'étape consistant à :

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décrypter chacune des données initiales associées cryptées d'au moins un algorithme de compression à base de données privé.

15. Procédé selon la revendication 14, dans lequel les données initiales cryptées sont contenues dans la trame de données, ou
dans lequel les données initiales associées à au moins un algorithme de compression à base de données privé incluent au moins un livre de codes de Huffman, ou
dans lequel les données initiales associées à au moins un algorithme de compression à base de données privé incluent au moins un livre de codes de quantification vectorielle.

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FIG. 1

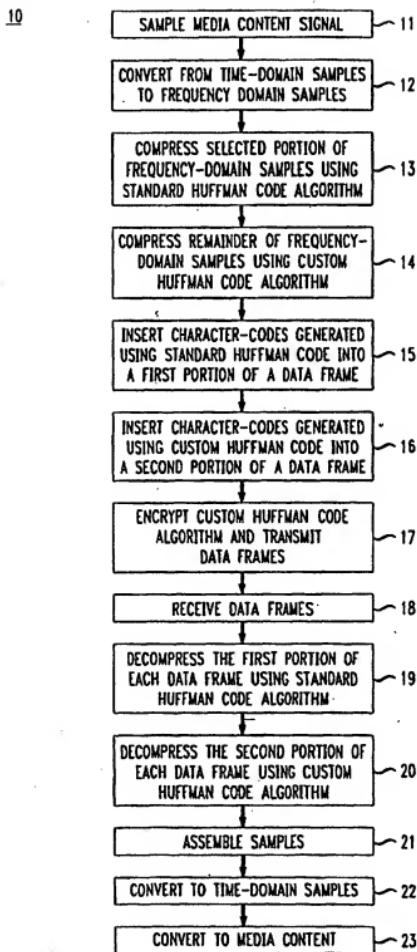


FIG. 2

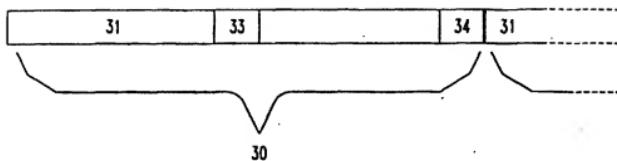


FIG. 3

